

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application:

1. (Currently amended) A barrier operator for moving a barrier between open and closed positions with respect to a barrier opening, comprising:

a light pattern generator to project an optical pattern across the barrier opening, the light pattern being a single substantially straight line in the absence of an obstruction and being projected during at least all movements of the barrier;

an imaging device to observe a portion of the barrier opening as illuminated by the optical pattern; and

a controller coupled to the imaging device to sense when the observed single substantially straight line in the observed portion of the barrier opening changes from a single substantially straight line, and generating a detection signal in response thereto, the detection signal being indicative of the presence of the obstruction at least during all movements of the barrier.

2. (Original) The barrier operator of claim 1, comprising apparatus for periodically recording images detected by the imaging device.

3. (Original) The barrier operator of claim 2, wherein the controller periodically compares an observed pattern detected by the imaging device with a digital representation of a non-obstacle pattern previously detected and recorded.

4. (Original) The barrier operator of claim 3, wherein the non-obstacle pattern is a substantially straight line.

5. (Original) The barrier operator of claim 1, wherein the digital imaging device observes the barrier path at an angle to the scanning device.

6. (Original) The barrier operator of claim 1, comprising an alarm device to generate an alarm indication in response to the detection signal.

7. (Original) The barrier operator of claim 6, wherein the alarm indication is an audible signal.

8. (Original) The barrier operator of claim 6 wherein the alarm indication is a visual signal.

9. (Original) The barrier operator of claim 1, comprising a barrier drive unit for moving the barrier, and wherein the controller is responsive to the detection signal to control the barrier drive.

10. (Original) The barrier operator of claim 1, wherein the light pattern generator comprises:

- a source of electrical energy;
- a laser diode; and
- an optical lens to focus a beam generated by the laser diode.

11. (Original) The barrier operator of claim 1, wherein the imaging device is a CCD camera.

12. (Original) The barrier of claim 1, wherein the light pattern generator is disposed on the barrier.

13. (Original) The barrier operator of claim 1, comprising a head unit with a motor for moving the barrier, and the imaging device is disposed on the head unit.

14. (Currently amended) A system for detecting an object, comprising:
a light pattern generator projecting a light pattern beam across a defined area associated with a barrier and producing a light pattern in the defined area at least during all movements of

the barrier, the light pattern being a single substantially straight line in the absence of an obstruction;

a digital imaging device for detecting the light pattern produced by the light pattern generator;

a controller having a memory with a stored image of a non-obstruction pattern detected in the defined area as produced by the light pattern generator; and

the controller periodically compares said image stored in the memory with the observed single substantially straight line detected by the imaging device produced by the light beam shining across the defined area and recorded by the digital imaging device and determines when the observed single substantially straight line changes from a single substantially straight line so as to be effective to determine a presence of the obstruction in the defined area at least during all movements of the barrier.

15. (Original) The system of claim 14, wherein, when the controller detects a difference between the digital representation of the light pattern produced by detecting the defined area and the image stored in a memory, the controller initiates an alarm.

16. (Original) The system of claim 14, wherein the image stored in the memory is of a substantially straight line produced by the pattern generator in the absence of an object in the defined area.

17. (Original) The system of claim 16, wherein the digital imaging device is a CCD camera, which is installed at an off-set angle from the laser device.

18. (Currently amended) A method of detecting an object in a defined area associated with a barrier using a light pattern generator and a digital imaging device, comprising the steps of:

projecting a beam from the light pattern generator across the defined area and producing an optical pattern during at least all movements of the barrier, the optical pattern being a single substantially straight line in the absence of an obstruction;

observing with a digital imaging device the optical pattern at an off-set angle to the

projected beam;

storing in a memory an image of a non-obstruction pattern produced by projecting the pattern across the defined area in absence of an obstacle;

detecting by the digital imaging device a present optical pattern;

periodically comparing the single substantially observed straight line with the stored image;

producing a control signal when the observed single substantially straight line changes from a single substantially straight line stored in the memory as a result of [[an]] the obstruction in the defined area the control signal being an effective indicator of a presence of the obstruction in the defined area at least during all movements of the barrier.

19. (Original) The method of claim 18, comprising generating an alarm signal responsive to the control signal.

20. (Original) The method of claim 18, comprising controlling a movement of a barrier in the defined area in response to the control signal.

21. (Currently amended) A barrier operator for moving a barrier along a barrier path between open and closed positions comprising:

a light pattern generator to project an optical beam across the barrier path during at least all movements of the barrier to produce a single substantially straight line in the absence of an obstruction;

an imaging device to observe the barrier path as illuminated by the optical beam; and

a controller coupled to the imaging device to effectively sense an obstacle obstruction illuminated by the optical beam when the observed single substantially straight line changes at least during all movements of the barrier.

22. (Currently amended) A barrier operator for moving a barrier between open and closed positions with respect to a barrier opening comprising:

a light pattern generator to project an optical beam across the barrier path during at least all movements of the barrier to produce a single substantially straight line in the absence of an

obstruction, said light pattern generator having the ability to be enabled and disabled;
an imaging device to observe the barrier opening;
a controller coupled to the imaging device to detect an enabled image of the barrier opening while the light pattern generator is enabled and to detect a disabled image of the barrier opening while the light pattern generator is disabled and generating a detection signal in response to the enabled and disabled images during all movements of the barrier to effectively determine a presence of the obstruction.

23. (Currently amended) A method of detecting an object in a defined area using a light pattern generator and a digital imaging device, comprising steps of:

projecting a beam from the light pattern generator across the defined area during at least all movements of the barrier to produce a single substantially straight line in the absence of an obstruction;

observing with a digital imaging device an optical illumination in the defined area;

storing in a memory an image of a non-obstruction optical illumination produced by

projecting the pattern across the defined area in absence of an obstacle;

detecting by the digital imaging device a present optical illumination pattern;

periodically comparing the present optical illumination pattern with the stored image;

and

producing a control signal when the observed single substantially straight line differs from a single substantially straight line stored image in the memory as a result of an obstruction in the defined area, the control signal being effective to indicate the presence of the obstruction at least during all movements of the barrier .

24. (Original) The method of claim 23, comprising generating an alarm signal responsive to the control signal.

25. (Original) The method of claim 23, comprising controlling a movement of a barrier in the defined area in response to the control signal.